

CLAIMS

1. A shape memory alloy actuator comprising:
 - a body constituting or connected to an activating member such that said
 - 5 activating member is moved between a first and a second position when said body is moved between a third and a fourth position,
 - releasable holding means for holding said body in said third position,
 - at least one first and at least one second wire made of a shape memory alloy such as nitinol, said first wire being connected to said body such
 - 10 that shortening of the length of said first wire exerts a force on said body for moving same from said fourth to said third position, and
 - a biasing means, such as a tension or compression spring or a piston and cylinder mechanism, attached to said body for biasing said body for moving same from said third to said fourth position,
 - 15 - said second wire being arranged such relative to said holding means that shortening of the length of said second wire or wires releases said holding means allowing said biasing means to move said body from said third position to said fourth position.
- 20 2. An actuator according to claim 1 and further comprising means for intermittently directing an electric current through said first and second wires for heating same to at least the shape memory alloy transformation temperature.
3. An actuator according to claim 1 or 2, wherein said holding means
- 25 comprises a brake mechanism.
4. An actuator according to any of the claims 1-3, wherein said holding means comprises a pawl mechanism.
- 30 5. An actuator according to claim 1, wherein said body is pivotably attached to a frame, said first and second wires are attached at one end thereof to said frame and connected at the other end thereof with said body such that shortening of the length of said first wire exerts a pivoting force on said body in

one pivoting direction and shortening of the length of said second wire exerts a pivoting force on said body in the opposite pivoting direction, and said biasing means is attached to said frame and arranged for exerting a pivoting force on said body in at least one of said pivoting directions.

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6. An actuator according to claim 5, wherein said biasing means is arranged for exerting a pivoting force on said body in both said pivoting directions with an intermediate balance point wherein said biasing means does not exert a pivoting force on said body.

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7. A shape memory alloy actuator comprising:

- a frame with a body pivotably attached thereto,
- at least one first wire and at least one second wire made of a shape memory alloy such as nitinol attached at one end thereof to said frame and connected at the other end thereof with said body such that shortening of the length of said first wire exerts a pivoting force on said body in one pivoting direction and shortening of the length of said second wire exerts a pivoting force on said body in the opposite pivoting direction, and

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- a biasing means attached to said frame and arranged for exerting a pivoting force on said body in at least one of said pivoting directions.

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8. An actuator according to claim 7, wherein said biasing means comprises a tension spring.

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9. An actuator according to claim 7 or 8, wherein said biasing means comprises a compression spring.

10. An actuator according to any of the preceding claims, wherein said biasing means comprises a piston and cylinder mechanism.

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11. An actuator according to any of the preceding claims and further comprising means for intermittently directing an electric current through said

first and second wires for heating same to at least the shape memory alloy transformation temperature.

12. A shape memory alloy actuator comprising:

- 5 - a body constituting or connected to an activating member such that said activating member is moved between a first and a second position when said body is moved between a third and a fourth position,
- holding means for holding said body in said third position,
- at least one first wire and at least one second wire made of a shape
- 10 memory alloy such as nitinol, said first wire being connected to said body such that shortening of the length of said first wire exerts a force on said body for moving same from said fourth to said third position, and
- a biasing means, such as a tension or compression spring or a piston and cylinder mechanism attached to said body for biasing said body for
- 15 moving same from said third to said fourth position,
- said second wire being arranged such relative to said holding means that shortening of the length of said second wire releases said body from said holding means such that said biasing means may move said body
- from said third position to said fourth position.

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13. An actuator according to claim 12 and further comprising means for intermittently directing an electric current through said first and second wires for heating same to at least the shape memory alloy transformation temperature.

25 14. An actuator according to claim 12 or 13, wherein said holding means comprises a brake mechanism.

15. An actuator according to any of the claims 12-14, wherein said holding means comprises a pawl mechanism.

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16. An actuator according to claim 12, wherein said body is pivotably attached to a frame, said first and second wires are attached at one end thereof to said frame and connected at the other end thereof with said body such that

shortening of the length of said first wire exerts a pivoting force on said body in one pivoting direction and shortening of the length of said second wire exerts a pivoting force on said body in the opposite pivoting direction, and said biasing means is attached to said frame and arranged for exerting a pivoting force on
5 said body in at least one of said pivoting directions.

17. An actuator according to claim 16, wherein said biasing means is arranged for exerting a pivoting force on said body in both said pivoting directions with an intermediate balance point wherein said biasing means does
10 not exert a pivoting force on said body.